—PROGRAM ABSTRACTS—

ALASKA GEOLOGICAL SOCIETY

Presents a

SYMPOSIUM

on

RESOURCE DEVELOPMENT

and

ENVIRONMENTAL CONSERVATION

ANCHORAGE, ALASKA

SEPTEMBER 18, 19 & 20, 1973

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SCHEDULE OF EVENTS
ALASKA GEOLOGICAL SOCIETY SYMPOSIUM

Monday — September 17, 1973

10:00 A.M. Registration — Mezzanine and Foyer — Anchorage-Westward Hotel

1:30— 5:00 P.M. Field Trip — Anchorage Area — Lobby (3rd Street Entrance)— Anchorage-Westward Hotel

5:30— 7:30 P.M. Reception — Cocktail Party — Ballroom — Anchorage-Westward Hotel

Tuesday — September 18, 1973

7:30— 8:30 A.M. Steering Committee-Speaker's Breakfast Port Room — Anchorage-Westward Hotel

9:00—11:45 A. M. Symposium Session — Sydney Laurence Auditorium — 6th and F Streets

12:00— 1:30 P.M. Luncheon — Alaska-Aleutian Room — Anchorage-Westward Hotel

2:00— 4:50 P.M. Symposium Session — Sydney Laurence Auditorium 6th and F Streets

Wednesday — September 19, 1973

7:30— 8:30 A.M. Steering Committee-Speaker's Breakfast Port Room — Anchorage-Westward Hotel

9:00—11:30 A. M. Symposium Session — Sydney Laurence Auditorium — 6th and F Streets

12:00— 1:30 P.M. Luncheon — Alaska-Aleutian Room — Anchorage-Westward Hotel

2:00— 4:30 P.M. Symposium Session — Sydney Laurence Auditoium 6th and F Streets

5:30— 6:30 P.M. Cocktail Hour — Ballroom — Anchorage-Westward Hotel

6:30— 8:30 P.M. Banquet — Ballroom — Anchorage-Westward Hotel

Thursday — September 20, 1973

7:30— 8:30 A.M. Steering Committee- Speaker's Breakfast — Port Room — Anchorage-Westward Hotel

9:00—11:30 A.M. Symposium Session — Sydney Laurence Auditorium 6th and F Streets

12:00— 1:30 P.M. Luncheon — Alaska-Aleutian Room — Anchorage-Westward Hotel

2:00— 5:00 P.M. Symposium Session — Sydney Laurence Auditorium 6th and F Streets

Friday, Saturday — September 21, 22, 1973

7:30 A.M. Friday — 8:00 P.M. Saturday

Field Trip — Anchorage-Glennallen-Valdez-Anchorage — Lobby (3rd Street Entrance) — Anchorage-Westward Hotel

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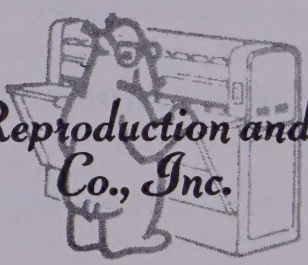

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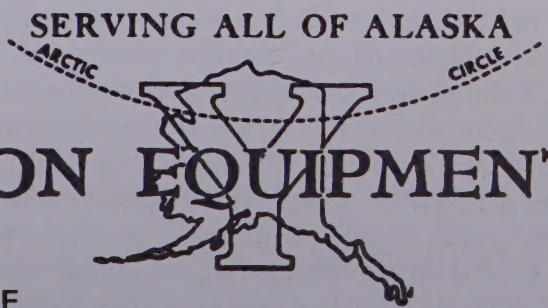

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ALASKA GEOLOGICAL SOCIETY SYMPOSIUM

Tuesday Morning, September 18, 1973

9:00 – 11:45 A.M.

Sydney Laurence Auditorium

PRESIDING: ROBERT L. McCOLLOM JR., Dames & Moore

9:00 WELCOMING ADDRESS

JOHN H. McKEEVER – President of Alaska Geological Society

9:15–10:00 THE CONFLICT – RESOURCE DEVELOPMENT VERSUS ENVIRONMENTAL CONSERVATION

VINCENT E. McKELVEY – Director, U.S. Geological Survey

Exponential growth in population and consumption of natural resources is approaching critical proportions worldwide. For the United States, even zero growth in population and consumption would make heavy demands on our natural resource potential during the next few decades.

Alaska contains vast potential resources of mineral fuels and metals that could help supply future national needs, and support State economic development as well. But Alaska is also an environmentally fragile area and is the nation's principal remaining wilderness with its priceless natural values. Decisions on the use of Alaska's land must weigh opposing choices in the light of resource and environmental knowledge and careful consideration of human values and national aspirations.

10:15–11:00 IMPACT OF THE NATIONAL ENVIRONMENTAL POLICY ACT ON INDUSTRY

JOHN M. HECKARD – Manager of Environmental Services
Dames & Moore

Much to the surprise of John Q. Public, the demands for energy and for natural resources are outstripping the available supply. And almost everyone agrees that the situation will deteriorate before it improves. It would be naive to blame NEPA for these problems, because a complex set of circumstances is responsible. However, it is clear that our efforts to improve this situation will be impeded by NEPA and all that has followed in its wake. NEPA alone is responsible for stopping construction on 35 nuclear power plants, at a time when many parts of the country were experiencing brownouts. It was also NEPA that resulted in the closing of mines and shutting down of oil wells, at the very time our nation is clamoring for more natural resources. Highways, airports, pipelines and many other public works projects have suffered delay because of NEPA.

At first glance, NEPA appears to be a relatively simple piece of legislation designed to encourage the federal government to consider environmental impact in its actions. In actuality, it has set a new public mood, resulted in numerous landmark court decisions, re-organized several federal regulatory agencies, precipitated similar action in a dozen states, and imposed a burden on industry quite unlike anything we have ever witnessed.

11:00–11:45 WHY THE CLAIMS ACT WILL SUCCEED

JOSEPH P. JOSEPHSON – Co-chairman
Joint Federal-State Land Use Planning Commission

(No Abstract Available)

Tuesday, Noon Luncheon

12:00

Ball Room of Anchorage-Westward Hotel

Speaker:

WILLIAM A. EGAN

Governor of State of Alaska

ALASKA: AN ENERGY STOREHOUSE

Tuesday Afternoon, September 18, 1973

2:00 – 4:50 P.M.

Sydney Laurence Auditorium

PRESIDING: ROBERT L. McCOLLOM JR., Dames & Moore

2:00–2:30 THE MINERAL CRUNCH

CHARLES F. PARK – Professor, Stanford University

The current increases in rates of consumption of raw materials in both the United States and the rest of the World cannot continue without serious shortages of several commodities developing in 10 to 20 years.

Many developing countries are seeking industrialization, yet insufficient materials exist to permit universal industrialization. The resulting competition for raw materials is becoming increasingly apparent and severe. Rates of consumption are increasing faster in many other nations than in the United States. Also costs in the United States are among the highest in the world, a fact that means we cannot sell our manufactured products abroad and hence have difficulties paying for our needed imports.

Present United States policies definitely discourage both exploration and development of domestic resources. Industry is being forced to go abroad for materials that could be produced here at home. Excessive imports add fuel to inflation and create many problems.

Alaska is the last area of the nation that has not been thoroughly combed for raw materials. In many of the more remote areas of the State the costs of transportation alone are so high that mining is uneconomic. Rather than attempt to preserve this very large area as an empty wilderness the government should accept the opportunity and challenge to show how a region can be developed. Is it impossible to preserve the environment and at the same time to have available some of the products of the region that are needed to maintain our standards of living?

2:30–3:15 DEVELOPMENT AT LOST RIVER, ALASKA

MURRAY E. WATTS – Lost River Mining Co., Ltd.

The Lost River Mining Corporation Limited fluorite-tin-tungsten deposits are located at Lost River, Seward Peninsula, Alaska. They occur 6 miles from the Bering Sea Coast and about 90 air miles north of Nome. The climate is sub-arctic, except that it is moderated by the open-water season of the Bering Sea, for about 6 months of the year.

A total of seven separate mineral deposits have been identified, associated with the major geological structure of the area – the low to flat-dipping Rapid River thrust fault which has been traced for some 5 miles across the property, forming a breccia zone in limestone. The latter rocks are of great thickness – having undergone two periods of folding and faulting with associated metamorphism – all subject to later block faulting causing displacements of the mineralized breccia zone in both an east-west and north-south direction.

Although fluorite is the dominant mineral throughout the brecciated zones in true widths up to 300 feet, tin and minor tungsten values also occur, but are confined to greisenized gneissic granite intrusions forming skarn zones. However, the association with the ore minerals is complex, with over 50 separate ones identified to date.

Ore reserves in fluorite and tin, outlined to the conclusion of the 1971 season, were reported by the consultants to have a minimum life of over 20 years in Zone 1 and Zone 2 only, at a daily rated capacity of 4,000 tons.

Exploratory diamond drilling, by the company, to the end of 1972 totals some 65,000 feet since its start in 1970. It is now in progress in No. 4A Zone with additional drilling planned for No. 2 Zone for the 1973 seasons program.

The preliminary estimate to bring the mine into production as an open-pit operation of the No. 1 Zone is $55,000,000 – and that for the City of Lost River as initially planned would tentatively total some $40,000,000. The latter would be a separate entity from the mine and operated independently by the City of Lost River Council. The five members are all appointed by the Governor of the State of Alaska.

It will seek Federal funding from existing enabling legislation designed for that purpose. The construction would include the housing, roads, airfield, communications, power, water, etc. – all of which is designed to self-funding, with the long-term Company's ore reserves forming the industrial base. The City is planned as the center for long-term regional development as well. Environmental Impact Statements are in progress on both the City of Lost River and its infra-structure, in addition to that for the mining company.

3:30–4:10 CHALLENGES OF OFFSHORE MINING

CHRISTOPHER GARSIDE – Lamont Geophysical Institute

Cooperation of both industry and the federal government to involve the scientific community in research on the effects of manganese nodule mining has provided a unique opportunity to evaluate potential environmental impact and formulate guidelines to allow rational use of this resource. The various possible impacts are defined; research to the present time is outlined and preliminary conclusions are drawn. Future areas of research are described which will provide a complete understanding of the problem prior to actual operation.

4:10–4:50 MINERAL DEVELOPMENT VS. PRESERVATION OF SCENIC VALUES, ALASKA

CHARLES C. HAWLEY – Consulting Geologist

Scenic value – the total visual impact of landscape – is often greatly impaired by development. Particularly in unscarred terrain, the visual impact of development affects even the casual observer, and negative visual impact is certainly one of the causes of the part rational and part emotional reaction against development which is currently so prevalent. Although the demands for mineral resources virtually guarantee that development will affect scenic regions in Alaska, preliminary mineral examinations can be almost non-destructive of scenery. Where development is warranted, design of facilities which either harmonize or contrast favorably with the environment can lessen negative visual impact.

In some areas of high natural scenic value, knowledge of mineral resources and geology already permits forecast of the amount of visual impact which would be caused by mineral development. Policies could favor exploration of parts of scenic regions where, for example, small bodies of high-grade ores exist whose exploitation would have minimum visual impact. One example would be the McCarthy area.

In other areas of high scenic value, development could be limited to parts of the areas beyond visual range of the public at large. A specific example would be the Brady Glacier nickel-copper deposit in Glacier Bay National Monument.

In still other areas, multi-disciplinary studies which rate scenic value, mineral potential, and the effect of development on wildlife systems, are needed as part of the decision-making process.

Advocates of non-development and non-growth should recognize that, as with the energy crisis, other mineral shortages will naturally develop within the next ten to twenty years which could so stifle our economy that preservation of scenic value would quickly become a non-issue. A balance between development and preservation must therefore be a goal sought in the immediate future.

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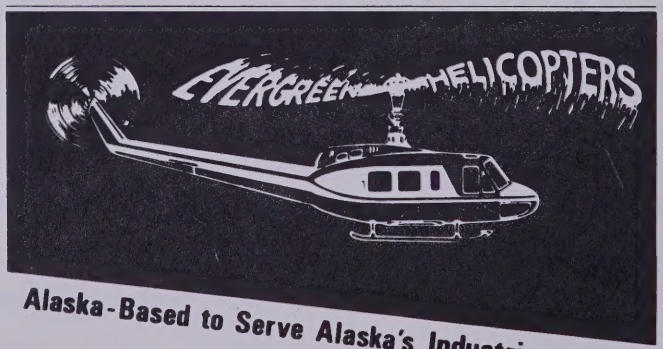

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ALASKA GEOLOGICAL SOCIETY SYMPOSIUM

Wednesday Morning, September 19, 1973

9:00 – 11:30 A.M.

Sydney Laurence Auditorium

PRESIDING: JOHN M. SWEET, Atlantic Richfield Co.

9:00–9:30 TRANS-ALASKA GAS PIPELINE PROJECT

BARRY HUNSAKER – Vice President, El Paso Natural Gas Co.

The Lower 48 States suffer from an unprecedented energy shortage which, if not eased, could have the most severe repercussions on the economic life of every state in the Union.

Alaska has a surplus of oil and gas and further exploration may reveal even greater reserves. These energy sources which can be developed to help alleviate the energy shortage in the Lower 48 States represent a significant economic opportunity for Alaska and its citizens.

On December 4, 1972, El Paso Natural Gas Company announced that it had begun the conceptual design of an all U.S. project to transport North Slope gas to the south coast of Alaska where it would be liquefied and transported by cryogenic tankers to the West Coast of the United States. This multibillion-dollar project offers many advantages to the State of Alaska, to the United States, to the producers and to the consuming public. It would not necessarily preclude a trans-Canadian pipeline and, through displacement, could make gas available to the pipelines now serving the Midwest from west Texas. The studies which have been undertaken on behalf of El Paso by several engineering consulting firms is proceeding on or ahead of schedule. It should be completed early in 1974, following which El Paso plans to complete such additional work as may be required to file applications with the federal Power Commission for implementation of the project.

9:30–10:00 TRANS-ALASKA PIPELINE: A CASE HISTORY

C. R. ELDER JR. – Executive Vice President,
Alyeska Pipeline Service Co.

(No Abstract Available)

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10:15–10:45 ENVIRONMENTAL STUDIES FOR A PROPOSED LNG PROJECT, ALASKA-CALIFORNIA

KEITH C. McKINNEY – Vice President
Pacific Alaska LNG

Pacific Alaska LNG Company, a subsidiary of Pacific Lighting Corporation, is proposing to purchase gas in the Cook Inlet area of Alaska, transport it to a liquefaction plant north of Kenai, and ship the liquefied natural gas to Los Angeles where the gas will be revaporized and sold to Southern California Gas Company for distribution to the public.

Environmental studies have been made on each segment of this project so that facility location and design fully consider protection of the environment as well as the need for a reliable energy source for southern California. A series of slides will be shown which will describe the project and the environmental analysis.

10:45–11:30 ENVIRONMENTAL CONSIDERATIONS IN THE DEVELOPMENT OF NUCLEAR ENERGY

JACK J. STEIN – Managing Director
Washington Public Power Supply

(No Abstract Available)

Wednesday Noon Luncheon

12:00

Ball Room of Anchorage-Westward Hotel

Speaker:

WALTER J. HICKEL

Former Secretary of the Interior

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University of Alaska's
ENVIRONMENTAL ATLAS OF ANCHORAGE
edited by Lidia L. Selkregg

In layman's language and interpretive, multicolor maps, this 105-page book describes the physical and biological nature of the entire Anchorage area, from the slope of its land to its climate, soils, water supply, vegetation, fish, and wildlife; from its abundant energy resources to its problems with air and noise pollution, flood potential, earthquakes, volcanoes and the increasing pressures of a fast-growing population.

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Order your copy of the "Environmental Atlas of the Greater Anchorage Area Borough, Alaska" from the Arctic Environmental Information and Data Center, 142 E. Third Ave., Anchorage, Alaska 99501 for $17.50 postpaid. Telephone 279-8528.

Wednesday Afternoon, September 19, 1973

2:00 – 4:30 P.M.

Sydney Laurence Auditorium

PRESIDING: JOHN M. SWEET, Atlantic Richfield Co.

2:00–2:45 DEVELOPMENT OF THE PRUDHOE BAY FIELD

FRANK K. RICKWOOD – President, BP Alaska Inc.

The Prudhoe Bay Field is being developed by BP Alaska and Atlantic Richfield to produce 1½ million barrels per day. The paper describes the outline plan for this production and the present state of the developments.

The extremely cold conditions on the North Slope cause unique development problems. Two main considerations in this are firstly providing protection and reasonable conditions for people to work in, and secondly causing the least disturbance to the natural surroundings. Fortunately these two aims can be made compatible, once it is accepted that oil field operations will cause some disturbance to the natural surroundings.

3:00–3:45 ENVIRONMENTAL STUDIES FOR TRANS-ALASKA CANADIAN GAS PIPELINE

VERN L. HORTE – President, Canada Arctic Gas Study Group

Two sister companies, Alaska Arctic Gas Study Company and Canadian Arctic Gas Study Limited, have undertaken during the past four years the most comprehensive environmental studies ever conducted for a single project. These studies, which were designed to examine the environmental feasibility of building and operating a $5 billion natural gas pipeline from Alaska's North Slope and Canada's Mackenzie Delta, have examined in detail the impact of the project on northern mammals, fish, birds and vegetation which might be affected. Mr. Horte will show a movie about the environmental considerations as they affect route selection and operation of the proposed pipeline.

3:45–4:30 DEVELOPMENT OF RESOURCES IN THE CANADIAN ARCTIC

V. H. ATRILL – Chairman, Great Plains Project

(No Abstract Available)

ALASKA GEOLOGICAL SOCIETY SYMPOSIUM

Wednesday Evening, September 19, 1973

Banquet

6:30 P.M.

Ball Room of Anchorage-Westward Hotel

Speaker:

PAUL MEADOWS

Petroleum Engineer, Mineral Position Analysis, Bureau of Mines

6:30 THE ROLE OF MINERALS IN THE ECONOMY

The earth is the source of all primary wealth. Minerals and energy are the lifeblood of industrialized civilizations. The U.S. now uses over 4 billion tons of new mineral supplies annually. Processed materials and energy derived from minerals are now valued at over $150 billion annually. The U.S. with only 6 per cent of the world's land area and population now uses about one-fourth of the world's new mineral supplies. Increasing pressure on world mineral supplies results from rising world populations and desires for increased standards of living. Energy and minerals accounted for a $6 billion deficit in the U.S. balance of trade in 1972. Projections of present trends would lead to a $100 billion deficit by the year 2000. Accelerated development of new and improved technology to increase productivity is essential.

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ALASKA GEOLOGICAL SOCIETY SYMPOSIUM

Thursday Morning, September 20, 1973

9:00 – 11:30 A.M.

Sidney Laurence Auditorium

PRESIDING: LIDIA L. SELKREGG, Univ. of Alaska, Sea Grant Program

9:00–9:45 LAND USE INVENTORY AND MAPPING FOR RESOURCE DEVELOPMENT AND CONSERVATION

JAMES R. ANDERSON – Chief Geographer
U. S. Geological Survey

The need for better information about the uses being made of land and other resources is becoming more and more evident as conflicts and compromises in resource development and conservation must be faced more and more frequently. Effective private and public planning for the future depends in part on an effective information base. To date there had been no systematic and comprehensive inventory and mapping of the current uses being made of land resources in the United States. Since the use of resources is a dynamic process, there is a need not only for initial inventory and mapping, but for a continuing updating of land use information collected and retained in a geographically-oriented information system.

In the Geography Program of the U.S. Geological Survey, we have been working experimentally for more than two years to develop a program which will provide needed data on current land use efficiently and in a timely way. A two-level resource-oriented land use classification system for use with remote sensor data has been developed. This system can be expanded by States, local governments, or by Federal agencies to the third and fourth levels for greater detail. The classification system and new methods of collecting current land use data using remote sensor source data have been successfully tested in the Mid-Atlantic States, San Francisco Bay Area, Tucson-Phoenix Area, and in the Ozarks Region. Because of the dynamics of land use, the emphasis in the collection, handling and dissemination of information must be on meeting the needs of users in the shortest time possible.

10:00–10:45 AN EVALUATION OF GEOLOGIC ANALYSIS FOR ENVIRONMENTAL PLANNING IN TEXAS

L. F. BROWN JR. – Associate Director,
Research Bureau of Economic Geology
The University of Texas at Austin

Environmental concerns and resource conservation have become points of intense focus in recent years by the Texas Bureau of Economic Geology. Realizing the growing importance of environmental protection on the one hand, and the critical need for land and resource use on the other, a dozen specially designed projects have been developed to define clearly and factually the nature of environmental systems and the status of natural resources in Texas. Projects range from intensive studies of local and regional areas of critical concern to statewide resource capability inventories. A common goal of each program is environmental-resource identification, evaluation, and delineation; innovative mapping is a key tool in each project. The ultimate goal of the Texas projects is proper definition and delineation of natural resource capability units – the fundamental factors in any fair land-use management system of the future.

The Environmental Geologic Atlas of the Texas Coastal Zone provides an example of the Texas approach in an area of 20,000 square miles that encompasses dynamic processes, delicately balanced natural environments, extensive and varied natural resources, and accelerating industrial, urban and recreational development. Environmental Geology maps document the nature and distribution of natural and man-made systems in the Coastal Zone; special-use derivative maps focus this information for the specialist. Natural Resource Capability maps outline land units that display distinctive attributes and limitations for general categories of use; such maps provide geographic limits to physical, biologic, and chemical parameters that must be considered when proper engineering designs and other land-use requirements are considered in the future.

Natural resource capability requires a scientific evaluation of the land and water resources of the State that will provide foresight needed to avoid extensive environmental impact by supplying alternatives and economic requirements for proper use long before development becomes a reality. The concept of natural resource capability should neither imply restriction nor dictate use, but should provide planning authorities with a realistic evaluation of the nature and degree of impact, or lack of impact, that potential uses will impose upon the land or water unit. Defining natural resource capability is a positive step toward proper land use that the scientist should take; it does not preclude any use of lands, but provides the basis needed to guarantee that use will be accomplished in full realization of the natural capacity of the environment.

10:45–11:30 "REQUIREMENTS AND NEEDS – IMPACT OF RECENT FEDERAL LEGISLATION ON ENVIRONMENTAL CONSERVATION"

JAMES L. AGEE – Regional Administrator,
Environmental Protection Agency, Seattle, Washington

Paper will discuss the implementation of the Federal Water Pollution Control Act Amendments of 1972, the Clean Air Act Amendments of 1970, and the impact of these programs on resource development in Alaska. Specifically the paper deals with Water and Air Quality Standards, the National Pollution Discharge Elimination System (Permit Program), significant deterioration of air quality, and best practical treatment concepts for both air and water pollution control.

Thursday Noon Luncheon

12:00

Ball Room of Anchorage-Westward Hotel

Speaker:

ERNEST H. LATHRAM
EROS Program Representative
Pacific Coast, Alaska Department of the Interior

THE WORTH OF EROS AND OTHER SATELLITES IN THE EFFECTIVE DEVELOPMENT OF THE ENVIRONMENT

"Effective development of the environment" implies several basic concepts. The environment is not merely a limiting factor governing the development of one or another earth resource; it is a resource itself, susceptible to inventory, management, and modification to improve its value to man. No single resource, including the environment, can be considered as a discrete entity; all must be considered in concert as dependent variables in a physical and biological continuum; change in the parameters of any resource will inevitably result in change in the parameters of others. Man must manage the use of all resources in a manner such that the net change in the physical and biological continuum, including adverse changes permitted in one resource to facilitate the use of others, will be beneficial to man. Such management requires a regional consideration of resource use far greater in scope than that of years past, a requirement that accentuates the need for regional land-use planning. Such management requires that inventory of earth resources include not only their state, but also their interaction, on a regional basis. It also requires that the results of management policies be repetitively monitored, at a rate commensurate with the rate of change between various resources, and at costs that are not prohibitive.

ERTS, Nimbus, and NOAA satellite views provide information on earth resources over areas of tens of thousands of square miles or more, viewed under common conditions, a regional view unobtainable by any other means. Because of their perspective, these satellites provide inventory information in a data base whose volume is many orders of magnitude less than that resulting from observation using conventional means. Also, because of their perspective, satellite observations provide information of regional scope not obtainable by conventional means. The frequency of observation of the same scene by satellite is adjusted to provide regional repetitive data on earth phenomena commensurate with their rate of change, a repetitive rate commonly unobtainable by conventional means of observation, or obtainable only by maximum employment of available conventional vehicles. Since staging costs occur only once in the life of a satellite, the cost of satellite information diminishes with each repetitive observation. Staging costs are repeated for each new survey by conventional means. Thus a new type of regional monitoring will be feasible by satellite and at less than the cost of monitoring by conventional means. Other satellites provide additional benefits. Skylab, while not providing Arctic data, is testing advanced instruments which will be of future use in Arctic study, and the Space Shuttle will test others. Proposed geostationary satellites also provide a capability for positioning a platform for observations of specific earth phenomena as required, rather than as permitted by the overpass schedule of current orbital satellites.

Compatible Resource Development and Environmental Conservation is Feasible. It is essential in Alaska and Worldwide. Understanding of the Problems and Objectives by Everyone is the Key to Achievement.

Our Compliments to the Alaska Geological Society for providing a much-needed forum.

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ALASKA GEOLOGICAL SOCIETY SYMPOSIUM

Thursday Afternoon, September 20, 1973

2:00 – 5:00 P.M.

Sydney Laurence Auditorium

PRESIDING: LIDIA L. SELKREGG, Univ. of Alaska, Sea Grant Program

2:00–2:45 THE ROLE OF THE STATE OF ALASKA IN BALANCING RESOURCE DEVELOPMENT WITH ENVIRONMENTAL CONSERVATION

MAX BREWER – Commissioner,
Alaska Department of Environmental Conservation

Alaska must balance, while at the same time encouraging, resource development and protection of the environment. It must, however, have both as neither can survive in the absence of the other in Alaska. The State can most effectively accomplish its role through rational and realistic planning which avoids the excesses of the exploitation methods of the past and the fervor of today's preservationist mood. Guidelines for accomplishing this balancing, or wise use of resources, must provide for stability and must have credibility in order to escape the excesses.

In order to balance resource development and environmental conservation the State must assess its potentials and its goals and then provide a long range plan for balanced development and protection. From the use of non-renewable resources, particularly those resources with a high return, can come the capital and the time needed to properly develop a sustained yield from the renewable resources on land and in the sea and to maximize the advantages offered by Alaska's geographic position as the hub between the Pacific rim nations, including North America, and Europe. Alaska's eventual role as the transportation hub, a recreational center for peoples of many nations and a window from which to gaze on the scenic and the open spaces cannot be realized without both resource development and protection of its unique environment. However, they must evolve concurrently and with more control and more planning by the State than has been obvious in the other states.

3:00–4:15 AN EVALUATION OF UTILIZATION OF EARTH SCIENCE IN URBAN PLANNING IN THE ANCHORAGE AREA, ALASKA

WILLIAM W. BARNWELL – Subdistrict Chief,
U.S. Geological Survey, Water Resources Division, Anchorage

ERNEST DOBROVOLNY – Research Geologist,
U.S. Geological Survey, Engineering Geology, Denver

WILLIAM H. BEATY – Planning Director,
Greater Anchorage Area Borough

WILLIAM W. BARNWELL

Geohydrological studies cooperatively funded by the city of Anchorage, the Greater Anchorage Area Borough, and the U.S. Geological Survey are providing natural resource information to planners and developers in the Anchorage area. These studies, which were begun in the mid-1950's and intensified following the 1964 Alaska earthquake, have concentrated on water availability and hydrological problems caused by urbanization.

Availability studies have included:

* Ground-water studies to determine the safe yield of the area's aquifers and their efficient utilization.
* Artificial recharge experiments to test the feasibility of increasing aquifer yields either by surface spreading or injecting excess surface water into the aquifers.
* Studies of the quantity and quality of surface water in major streams in the Anchorage Borough.

Urban hydrology studies have been designed to provide planners and community officials with basic information on which to make informed decisions on land use development.

Reports and maps being developed from these studies include:

* A report on the Hillside area that will provide data on water availability, on site waste disposal, and land drainage in a rapidly growing suburban area of Anchorage.
* Generalized drainage maps of the Anchorage area that will include depth to the water table, permeability of surficial materials, and the elevation of the water table.
* A pollution susceptibility map of the Anchorage area. This map will integrate such factors as location of flood plains, depth to water table, slope of land surface, thickness of unconsolidated sediments, and surficial permeability.
* A report on the effects of the area's sanitary landfills on the local and regional hydrology.
* A report on the lowland areas southwest of the city of Anchorage with reference to land drainage practices and the maintenance of water levels and the quality of water in lowland lakes.

* Reconnaissance hydrologic reports in the Girdwood-Alyeska and Eagle River-Chugiak areas designed to provide planners, developers, and land owners with a summary of all hydrological and geological information available to date.

Special emphasis has been placed on communication and the need for the utilization of hydrological information in the decision-making process. These efforts include a continuing dialogue with planners, city and borough officials, interested citizens, and consultants. Reports and maps have been designed both for laymen and to meet the needs of planners and other users.

ERNEST DOBROVOLNY

In consequence of the geologic effects of the Alaska earthquake of 1964 and their impact on land development in Anchorage, local Government officials requested the U.S. Geological Survey to do geologic work deemed necessary for Boroughwide planning. To meet this request, a general geologic map of the entire Greater Anchorage Area Borough has been prepared. Some special-purpose maps of selected areas of the Borough have been published and some are in preparation.

Though basic to any rational understanding of the ground conditions, a standard geologic map does not, by itself, convey information to planners that is directly useful in their work. Therefore, special-purpose interpretive maps are being prepared in a form more meaningful to planners and other users.

Interpretive maps of selected areas where planning needs are critical have been published, released in open-file or are in preparation. For the metropolitan area as defined by the Anchorage and vicinity topographic map, the following have been released: generalized geologic map, slope map, construction materials map, and foundation and excavation conditions map. Soon to be released are a slope stability map and a landform and environmental geology summary map. Other selected areas for which interpretive maps have been released or are in preparation are in the vicinity of Eagle River-Birchwood and Girdwood.

Geologic and interpretive maps prepared under this program are intended as a guide for general land-use planning. They define the major geologic constraints placed on use of the land and indicate where certain kinds of development problems may exist. These maps should not be considered as a substitute for site planning. Site planning requires more detailed and specific information than can be shown on these maps.

WILLIAM H. BEATY

For the past several years, there has been a close financial and working relationship between the U.S.G.S. and the Greater Anchorage Area Borough. This relationship has produced numerous studies relating to water quality, water availability and natural characteristics of the land as related to urban development. These studies by the U.S.G.S. have been utilized by the Borough Planning Department and local government in a variety of ways ranging from subdivision review and analysis to the development of a comprehensive plan. The purpose of my presentation will be to describe some of these studies and discuss their specific application to the solution of urban problems in the Greater Anchorage Area Borough.

4:15— **Panel: Symposium participants**

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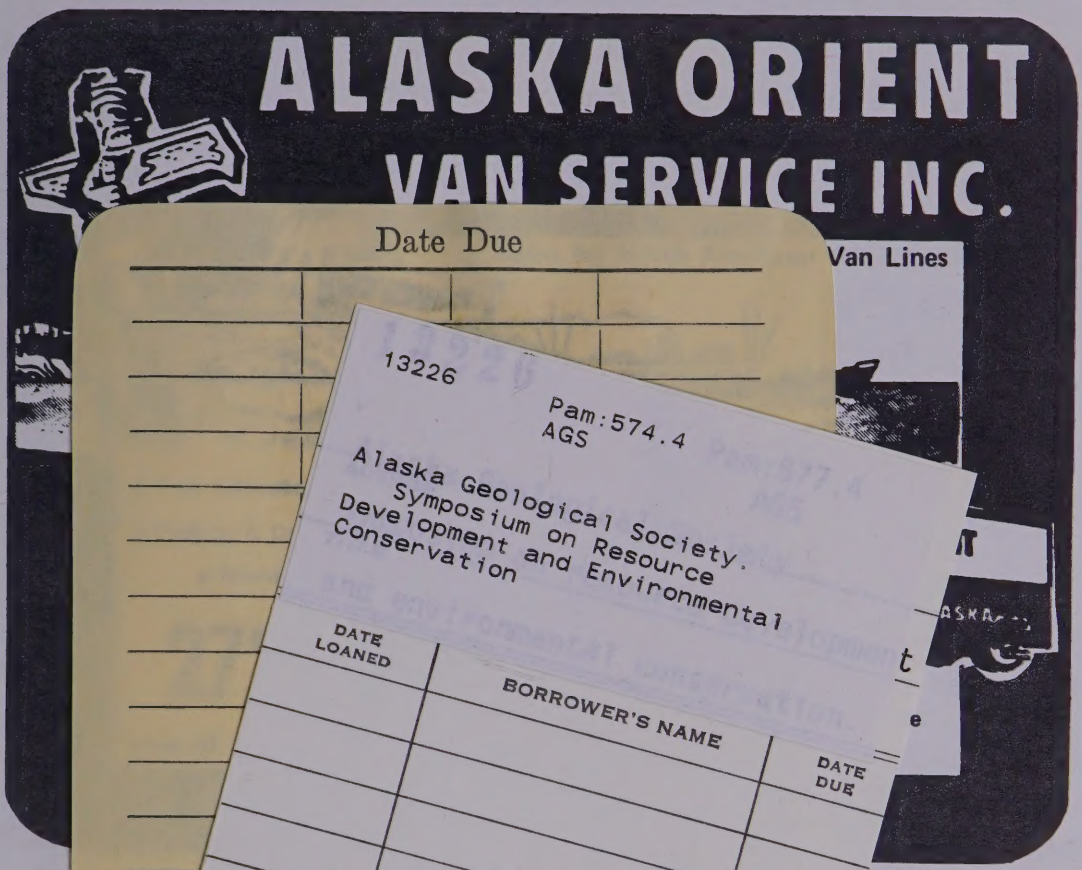

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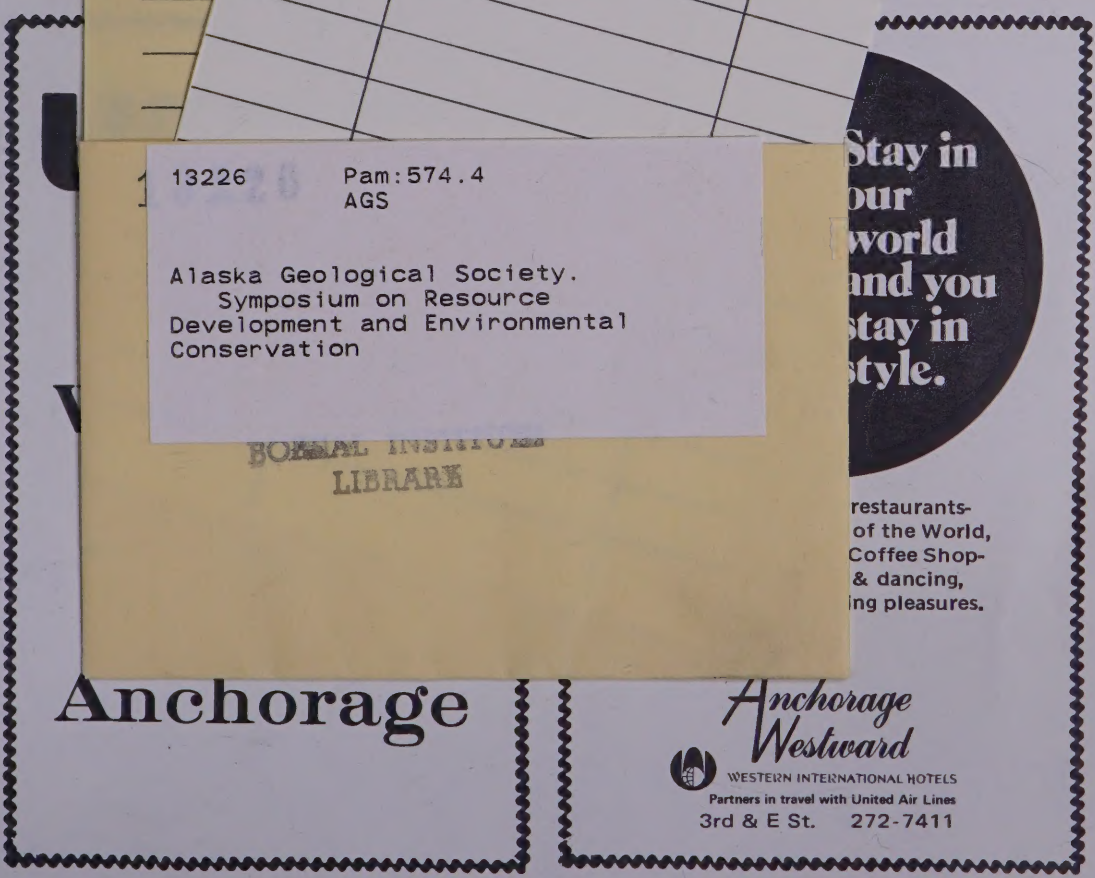

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